DEDIU, St., dr.; ISTODOR, N. dr.; BOCIRNEA, C., dr.; ANGELESCU, M. dr.; RUSU, V., dr.; VASILIU, Petra, dr.; MARICA, Maria, dr.; BARON, Olga, dr.

Meningoencephalitis with Listeria monocytogenes. Med. intern. (Bucur.) 16 no.7:871-879 Jl '64.

1. Lucrare efectuata in Clinica I de boli contagioase I.M.F. [Institutul medico-farmaceutic], Bucuresti si Sectia diagnostic a Institutului "Dr. I.Cantacuzino".

L 41177-66 T JK

ACC NR: AP6030836 SOURCE CODE: RU/0023/66/011/001/0031/0039

AUTHOR: Rusu, V. (Doctor); Andronescu, C.--Andronesku, K. (Doctor); Borsai, L.--Borshay, L. (Doctor); Marion, M. (Doctor); Baron, O. (Doctor) 24 B

ORG: "Dr. I. Cantacuzino" Institute of Microbiology, Parasitology and Epidemiology (Institutul de microbiologie, parazitologie si epidemiologie "Dr. I. Cantacuzino") 6

TITLE: Considerations on the etiological diagnosis of listerian meningitis [This paper was presented at Scientific Session "100th Birthday of Professor I. Cantacuzino" held in November 1963.]

SOURCE: Microbiologia, parazitologia si epidemiologia, v. 11, no. 1, 1966, 31-39

TOPIC TAGS: diagnostic medicine, bacteriology, infective disease

ABSTRACT: In view of the difficulties encountered in the first case in Rumania of an identified human strain of Listeria monocytogenes, the authors discuss: observations relating to each stage of the diagnosis, with emphasis on unusual aspects; the establishment of a differential diagnosis and avoidance of confusion with other germs such as corinebacteria, enterococci, etc.; a diagnostic scheme for the diagnosis of human listeriosis, especially neurolisteriosis, adaptable for use in any bacteriological laboratory. The authors thank Professor N. Stamatin for the supply of corinebacteria and erisipelotrix provided. The authors also thank Doctor Al. Pop. for assistance with the diagnosis. Orig. art. has: 1 table. /JPRS: 35,814/

SUB CODE: 06 / SUBM DATE: 02Feb65 / ORIG REF: 005 / OTH REF: 008

Card 1/1 HS

KOBLIKOVA, A.G.; ZABOZLAYEV, B.S.; BARON, R.M.

Coating furniture parts with paper in finishing them with nitro enamel. Der.prom. 8 no.1:21 Ja '59. (MIRA 12:1)
(Wood finishing)

1. BARON, S.

2. USSR (600)

4. Operation of Motor Vehicles

7. Driver-Stakhanovite Artemiy Nikolayevich Primenov, Avtomobil', No. 4, 1952.

9. [redacted] Abstract of CSDB 2877, Unclass.

66815

~~16(1)~~ 16 4000

AUTHOR: Baron, S. [A.]

SOV/155-58-5-4/37

TITLE: On Summation Factors for Double Series Which are Absolutely Summable With the Cesaro Method

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 5, pp 19-20 (USSR)

ABSTRACT: Starting from the investigations of Kangro [Ref 1,2] the author investigates the following problem (in the denotations of [Ref 1,2]): Which conditions the sequence $\{\varepsilon_{mn}\}$ must satisfy in order that the $C^{\gamma,\delta}$ (or $C_b^{\gamma,\delta}$, $C_r^{\gamma,\delta}$, $C_l^{\gamma,\delta}$)- summability of $\sum_0^\infty \varepsilon_{mn} u_{mn}$ follows from the $C_1^{\alpha,\beta}$ - summability of $\sum_0^\infty u_{mn}$.

Theorem: Let $0 \leq \gamma, \delta \leq \alpha, \beta$. In order that the numbers ε_{mn} be summation factors for the types a.)$(C_1^{\alpha,\beta}, C^{\gamma,\delta})$ b.)

Card 1/ 2

On Summation Factors for Double Series Which are Absolutely Summable With the Cesaro Method

$(c_1^{\alpha,\beta}, c_b^{\gamma,\delta})$ c.) $(c_1^{\alpha,\beta}, c_r^{\gamma,\delta})$ d.) $(c_1^{\alpha,\beta}, c_1^{\gamma,\delta})$, it is necessary and sufficient that

$$\Delta_{mn}^{\alpha\beta} \epsilon_{mn} = 0 \left[(m+1)^{-\alpha}(n+1)^{-\beta}\right]$$

$$\Delta_{m}^{\alpha} \epsilon_{mn} = 0 \left[(m+1)^{-\alpha}(n+1)^{\delta-\beta}\right]$$

$$\Delta_{n}^{\beta} \epsilon_{mn} = 0 \left[(m+1)^{\gamma-\alpha}(n+1)^{-\beta}\right]$$

$$\epsilon_{mn} = 0 \left[(m+1)^{\gamma-\alpha}(n+1)^{\delta-\beta}\right]$$

There are 7 references, 4 of which are Soviet, 2 English and 1 German.

ASSOCIATION: Tartuskiy gosudarstvennyy universitet (Tartu State University)

SUBMITTED: January 20, 1958

Card 2/2

BARON, S., kand.fiz.-matem.nauk; TAMMAY, T [Tammai, T.]

Summability factors in the Cesàro method of negative order.
Eesti tead.akad.tehn.füüs. no.1:33-36 '62.

1. Tartuskiy gosudarstvenny universitet.

16(1)

AUTHORS: Kangro,G.,and Baron,S. [A.] SOV/20-124-4-5/67

TITLE: Summation Factors for Double Series Summable by Cesaro's Method (Mnozhiteli summiruyemosti dlya dvoynykh ryadov, summiruyemykh metodom Chezaro)

PERIODICAL: Doklady Akademii nauk SSSR,1959,Vol 124,Nr 4,pp 751-753 (USSR)

ABSTRACT: The author considers the following problem: What conditions have to be satisfied by the double sequence λ_{mn} in order that from the summability of the series u_{mn} according to a certain Cesaro method there follows the summability of the series $\lambda_{mn} u_{mn}$ according to a (in general other) Cesaro method. If the λ_{mn} satisfy the mentioned conditions, then they are called summation factors. In three theorems formulated without proof, for several cases the author gives the desired

Card 1/2

Summation Factors for Double Series Summable According to Cesaro SOV/20-124-4-5 67

necessary and sufficient conditions. From these results there follow several theorems of Hardy [Ref 7], Moore [Ref 3], Hamilton [Ref 6] etc. Some examples are given.
There are 8 references, 2 of which are Soviet, 4 American, 1 English, and 1 Japanese.

ASSOCIATION: Tartuskiy gosudarstvennyy universitet (Tartu State University)
PRESENTED: December 3, 1958, by A.N.Kolmogorov, Academician
SUBMITTED: January 31, 1957

BARON, S., kand. fiz.-matem. nauk; PALLUM, E.; PETERSON, M.

On two theorems of Chow and their generalizations for double series. Izv. AN Est. SSR. Ser. fiz. mat. i tekh. nauk 11 no.4: 277-287 '62. (MIRA 16:1)

1. Tartuskiy gosudarstvennyy universitet i Institut kibernetiki AN Estonskoy SSR.

(Series)

BARON, S. A., Cand of Phys-Math Sci (diss) "Multiples of Integrals for Binary Rows," Tartu, 1959, 11 pp (Tartu State Univ, Chair of Geometry) (KL, 1-60, 119)

BARON, S. [A.]

New proofs of the main theorems of the summability factors. Eesti tead akad tehn fuus 9 no.1:47-68 '60. (EEAI 9:9)

1. Tartuskii gosudarstvennyy universitet, Tartu.
(Series) (Convergence)

BARON, S.G.; GREBENNIKOV, V.V.; LYUBINSKIY, N.M.; TSEYTLIN, G.D.; BAPONOV, A.Ya., red.

[Easing the start of engines in winter] Oblegchenie puska dvigatelei v zimnee vremia. Moskva, Nauchno-tekhn. izd-vo M-va avtomobil'nogo transporta i shosseinykh dorog RSFSR, 1963. 70 p. (MIRA 17:10)

SHCHENKOV, S.S.; BARON, S.G.

The AEGP-2 unit for welding in an atmosphere of carbon oxide. Biul. tekh.-ekon. inform. Gos. nauch.-issl. inst. nauch. i tekh. inform. 17 no.2:28-29 '64. (MIRA 17:6)

[illegible]G.; [illegible], I.V.; [illegible], A.A.; [illegible], B.I.; [illegible], A.Ia., red.

[Easing the start of engines in winter] Oblegchenie puska dvigatelei v zimnee vremia. Moskva, Mashgiz, Tsentr. in-t nauchno-tekhn. inform. M-va avtomobil'nogo transporta i shosseinykh dorog RSFSR, 1963. 70 p. (MIRA 17:10)

BARON, V.

Syndroma Tietze. Acta chir. iugosl. 3 no.4:305-329 1956.

1. Ortopedska klinika Medicinskog fakulteta u Zagrebu (predstojnik prof. dr. F. Grospic).
(RIBS, dis.
Tietze's dis. (Ser))

BARON,V.; DURRIGL,T.

Peripheral lesions of the extremity following immersion (immersion foot and hand syndrome). Acta chir. iugosl. 6(7) no.3:213-221 '59.

1. Ortopedska klinika Med. fakulteta u Zagrebu, Predstojnik: prof. dr. F. Grospic; i Centralna reumatoloska stanica u Zagrebu, Ravnatelj: prim. dr. D. Cop.

(IMMERSION FOOT case reports)
(HANDS dis.)

ANDRIYEVSKIY,B., inzhener; GLOTOV,Yu., inzhener; BARON,V., inzhener

Methods of deadwood gland repairs on "Ul'ian Gromov" type vessels.
Mor.flot 15 no.9:24 S'55. (MLRA 8:11)
(Ships--Maintenance and repair)

BARON, V., GLOTOV, Yu.

Replacing the main engine on ships of the "Melitopol'" type. Mor. flot 18 no.8:18-19 Ag '58. (MIRA 11:9)

1. Nachal'nik proyektno-konstruktorskogo byuro Estonskogo parokhodstva (for Baron). 2. Starshiy inzhener sluzhby sudovogo khozyaystva Estonskogo parokhodstva (for Glotov).
(Marine diesel engines)

BARON, V.A., inzh.; GLOTOV, Yu.G., inzh.

Seagoing, self-propelled ice-breaking ferry. Sudostroenie 24 no.1:3-6 Ja '58. (MIRA 11:2)
(Ice-breaking vessels) (Ferries)

BARON, V.R.

Nomogram for the hydraulic calculation of medium- and high-pressure gas pipe lines. Gaz.prom. 5 no.2:42-44 F '60.
(MIRA 13:6)

(Gas pipes)

BARON, V.

Spondylolisthesis. Acta chir. Iugosl. 8 no.1:1-23 '61.

1. Ortopedska klinika Medicinskog fakulteta u Zagrebu (predstojnik prof. dr F.Grospic).
(SPONDYLOLISTHESIS)

BARON, V.A. (Tashkent)

Seepage of water from a shallow channel with a highly permaeble layer at a finite depth, taking infiltration into account. PMTF no.1:101-105 Ja - F '61. (MIRA 14:6)
(Soil percolation)

RESHETKINA, N.N.; YAKUBOV, Kh.; SLAVIN, B.A.; POSTNOV, Yu.V.; SOKOLOVSKAYA, Ye.A.; USMANOV, A.; BELOV, V.A.

Construction of vertical drainage in the Golodnaya Steppe. Mat. po proizv. sil. Uzb. no.15:281-306 '60. (MIRA 14:8)

1. Institut vodnykh problem i gidrotekhniki AN UzSSR; Uzbekskiy gidrogeologicheskiy trest i Glavgolodnostepstroy.
(Mirzachul' region--Drainage)

BARON, V.A.

Unsteady flow of underground waters to the vertical drainage well.
Vop. gidr. no.3:141-151 '61. (MIRA 15:4)
(Drainage)

BARON, V.A.

Determining the total yield of a well system of vertical drainage.
Vop. gidr. no.3:152-156 '61. (MIRA 15:4)
(Drainage)

BARON, V.A.

Determination of the water permeability of soils. Izv.AN Uz. SSR.Ser.tekh.nauk 7 no.2:48-54 '63. (MIRA 16:4)

1. Institut vodnykh problem i gidrotekhniki AN UzSSR.
(Soil percolation)

L 53726-65 EWT(1) GW

ACCESSION NR: AP5017253 UR/0167/64/000/004/0042/0051

AUTHOR: Baron, V. A.

TITLE: Open-cut drainage in the presence of a drainage layer at a finite layer

SOURCE: AN UzSSR. Izvestiya. Seriya tekhnicheskikh nauk, no. 4, 1964, 42-51

TOPIC TAGS: hydrology

ABSTRACT: In many Soviet irrigated regions, the soil is underlain by an easily permeable, water-bearing bed. The water table in such cases is usually above or below the piezometric surface of the water-bearing layer, and therefore the latter either drains the territory or else causes rising percolation into the top soil. The presence of such an underlying layer is therefore an important factor in planning drainage channels in irrigated areas.

Card 1/2

L 53726-65
ACCESSION NR: AP5017253

The situation where the water table lies below the piezometric surface of the underlying layer has been dealt with in detail in Soviet studies; the present article is a study of the opposite case, in which the table lies above. This is of great practical importance, as in the case of introducing vertical drainage in the old irrigation zone of the Golodnaya Steppe over an area of 210,000 hectares.

The author derives two sets of equations, one for a deep underlying porous layer, the other for a shallow layer; these equations can be used to determine the effective range of influence of a drain, given values of the physical parameters (dimensions and depth of drain, amount of flow, etc.)

Orig. art. has: 3 figures, 45 formulas.

ASSOCIATION: SANIIVPiG

SUBMITTED: 23Mar64 ENCL: 00 SUB CODE: ES

NR REF SOV: 009 OTHER: 000 JPRS

Card 2/2

BARON, V.A.

Closed drainage with the draining layer situated at a finite depth. Izv.AN Uz.SSR.Ser tekh.nauk 8 no.4:42-51 '64.

Calculating a well for vertical drainage with a gravel filter. Ibid.:70-71 (MIRA 18:4)

1. Sredneaziatskiy nauchno-issledovatel'skiy institut vodnykh problem i gidrotekhniki.

BARON, V.L., inzh.

Using the granular ammonium nitrate explosives in underground mining abroad. Vzryv. delo no.57/14:303-314 '65.
(MIRA 18:11)

1. Trest Soyuzvzryvprom.

BARON, V.L., referent

Study conducted in England on the shattering of blocks of rock by blasting. Vzryv. delo no.50/7:109-113 '62.
(MIRA 15:9)

(Rocks--Testing) (Great Britain--Blasting)

BARON, V.L., gornyy inzh.

Calculation of underground breaking with a simple explosive in the IUkspor" Mine of the "Apatit" Combine. Vzryv. delo no.54/11:215-219 '64. (MIRA 17:9)

1. Moskovskiy institut radioelektroniki i gornoy elektromekhaniki.

BARON, V. V.

USSR/Chemistry - Systems
Chemistry - Magnesium, System: Zinc

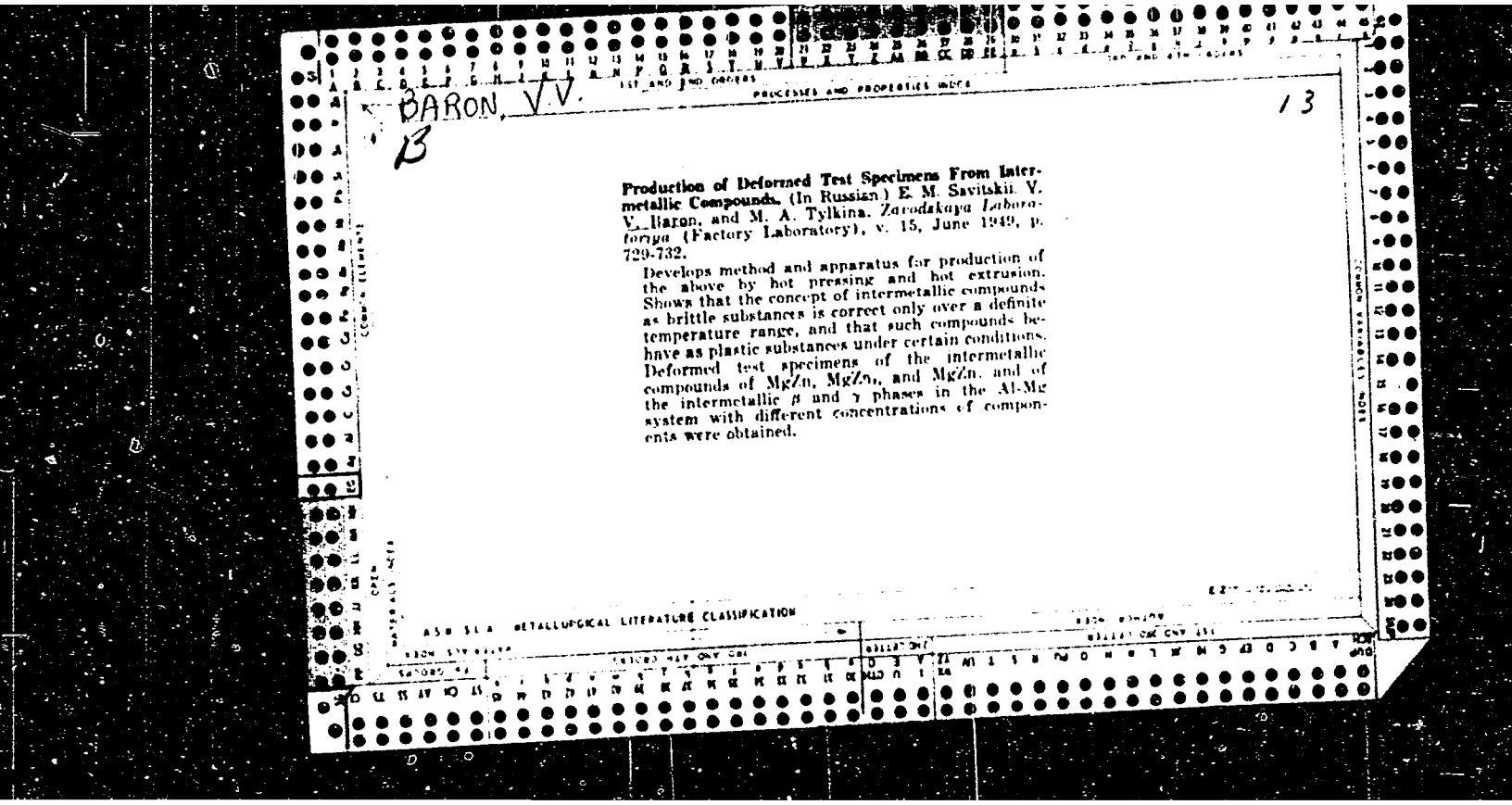
Feb 49

"Diagrammatic Structure and Mechanical Characteristics of the Mg-Zn System," Ye. M. Savitskiy, V. V. Baron, Inst Gen and Inorg Chem imeni N. S. Kurnakov, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LXIV, No 5 pp. 693-696

Tried to obtain deformed samples, and to experiment with samples processed by pressure, as well as those in a cast state. Placed particular stress on two points: (1) influence of the kinetics of establishing equilibrium in the form of a structural diagram of Mg-Zn, and diagram of composition and mechanical characteristics, and (2) study of the effect of temperature on the mechanical characteristics of alloys enriched by intermetallic compounds. Submitted by Acad G. G. Urazov, 6 Dec 48.

PA 29/49T2



BARON, V.V.

B

13

Production of Deformed Test Specimens From Intermetallic Compounds. (In Russian.) E. M. Savitskii, V. V. Baron, and M. A. Tylkina. *Zavodskaya Laboratoriya* (Factory Laboratory), v. 15, June 1949, p. 729-732.

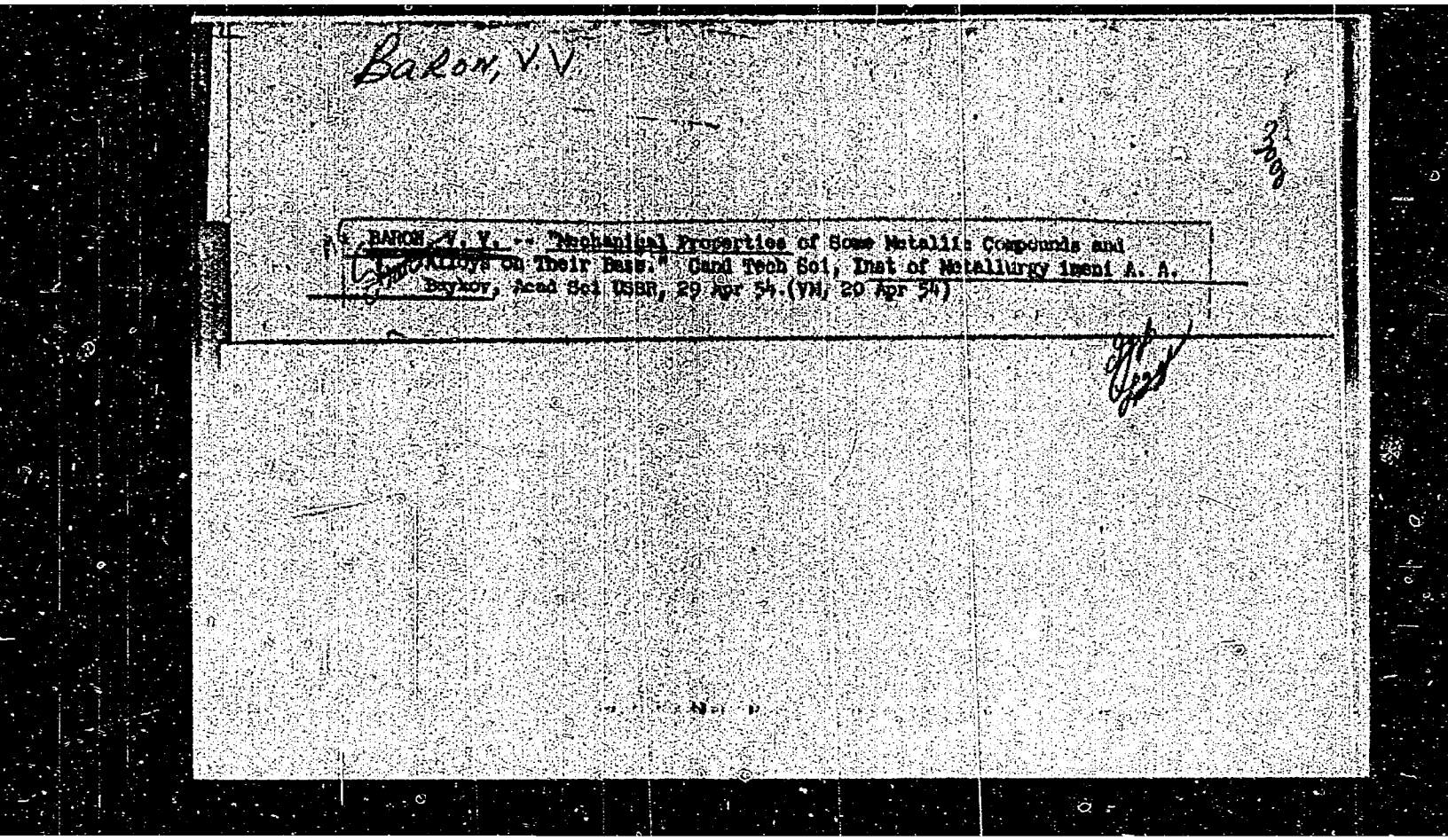
Develops method and apparatus for production of the above by hot pressing and hot extrusion. Shows that the concept of intermetallic compounds as brittle substances is correct only over a definite temperature range, and that such compounds behave as plastic substances under certain conditions. Deformed test specimens of the intermetallic compounds of $MgZn$, $MgZn_2$, and Mg_2Zn_3, and of the intermetallic β and γ phases in the Al-Mg system with different concentrations of components were obtained.

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

BARON, V. V.

Mechanical properties of magnesium-cadmium alloys. N. S. Kurnakov and V. V. Baron. *Izvest. Akad. nauk S.S.S.R., Otdel. Khim. Nauk* 1937, 301-7.—The hardness *A*, tensile strength *r*, and ductility *s* of Mg-Cd alloys in the range of 0-100 mole % Cd were detd. at room temp., and at 200 and 350°. The alloys were pptd. by the addn. of Mg under melted Cd with carnallite flux. Preliminary tests indicated that 250° below the evapn. temp. of the most volatile alloys, was sufficient for the homogenization of all solid solns.; compns. corresponding to MgCd attained equil. in 2 hrs. and those of Mg_3Cd and $MgCd_3$ in 4 hrs. However, all samples were kept for 6 hrs. at 280° in glass tubes sealed in vacuo before testing as follows: (a) *k* and *s* detd. at room temp. plotted as functions of the compn. C passed through 2 min. max. at compns. corresponding to the *k* compds. The same functions of *k* and *s* detd. at 200° and at 350° showed no transition in behavior at the existence of the compd. MgCd. (b) The functions of *k* and *s* detd. at room temp. on specimens quenched from 280° in H_2O passed through 1 max. at 40% Cd. The value of *k* (at compn. = $MgCd_3$) was 100 kg./sq. mm. compared with 76-80 kg./sq. mm. of *k* in *a* (~25% decrease). Simultaneously *s* decreased 45% and *e* increased 60-70%. (c) The function *k* at compn. at room temp. of specimens held 1 day at 200° and then quenched passed through 1 min. (between 2 max.) at compn. corresponding to MgCd. The microstructures of alloys corresponding to MgCd are those of homogeneous solid solns. in specimens quenched from 280°, whereas those of annealed specimens show the presence of twinning slippage indicating the appearance of chem. compds. at the grains of the solid soln. Thus, it appears that the compd. MgCd is formed out from the melt but from solid soln.

J. Bergmann



Baron, V.V.

BARON, V. V. -- "Mechanical Properties of Some Metallic Compounds and Alloys on Their Base," Cand Tech Sci, Inst of Metallurgy imeni A. A. Baykov, Acad Sci USSR, 29 Apr 54. (VM, 20 Apr 54)

BAROV, V.V.

Influence of temperature on the strength of brittle metallic substances. V. Y. Baron and E. M. Savitskii (*Doki. Akad. Nauk SSSR*, 1954, [illegible]). Tensile and compressive strength of Ti, Co, and of brittle metallic compounds of the NiSi, Ni_2Si, and Cu_2Si type is measured at different temp. up to their m.p. In contrast to the ductile metals whose strength decreases with temp. according to an experimental law, the brittle materials show an initial increase of strength up to a max. occurring for tensile strength at $T = 0.3-0.6\ T_m$ (where T_m is the m.p. temp.) and for compressive strength at $T = 0.7-0.5\ T_m$. After reaching max., the strength of the brittle alloys declines along an exponential curve represented by $M_t = M_0 \exp[-a(t_1-t_0)]$, where M_t and M_0 are the values of a mechanical property at temp. t_1 and t_0, respectively, and a a constant. Hardness of both the ductile and brittle materials alike decreases steadily with rising temp.

S. K. Lachowicz

gff

Inst Gen & Inorg. Chem - im. N.S. Kurnakov, AS USSR

Baron, V. V.

137-58-1-1909

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 1, p 256 (USSR)

AUTHORS: Savitskiy, Ye. M., Baron, V. V.

TITLE: The Hardness and Ductility of Molybdenum-base Alloys (Tverdost' i plastichnost' splavov na osnove molibdena)

PERIODICAL: V sb.: Prochnost' metallov, Moscow, AN SSSR, 1956, pp 144-161

ABSTRACT: An investigation is made into the properties and microstructure of cast Mo alloys with B, Si, Ti, V, Cr, Zr, Nb, Ta, and W added in quantities of 10 and 20 percent, and also of alloys containing up to 0.5 percent Al and up to 0.2 percent C. The specimens were smelted in an electric arc furnace in an Ar atmosphere. Hardness (H) was measured at room and elevated (1150°) temperature, while the ductility of the alloys was determined by upsetting specimens in a press. The H of Mo at 20° is increased 3-4 times by additions of B, Si and Zr. A considerable increase in H is observed on introduction of 15 percent Cr and 1 percent B. Additions of 1-20 percent W do not increase the H of Mo. An insignificant increase in H is observed when V, Nb, and Ti (Ti + 1 percent B) is added to Mo. At 1150°, the greatest increase in H is observed on addition of B, Si, and Zr to Mo. V, Ta, and Nb also significantly

Card 1/2

The Hardness and Ductility of Molybdenum-Base Alloys

increase the strength of Mo at 1150°. The least effect is caused by Ti and W. At 1150°, the reduction of H is greatest in alloys containing B, Si, Zr, V, and Ta when the content of these elements is up to 10 percent, when the Nb and Cr content is up to 5 percent, and with W up to 20 percent. The alloy containing Ti has the greatest softening effect. Addition of K > 0.2 percent to Mo causes a pronounced reduction in the ductility of Mo, and when there is > 5 percent B, the alloys become embrittled. The ductility of an Mo-Si alloy drops sharply when the Si content exceeds 0.32 percent, and it is zero at 3.5 percent Si. Alloys containing up to 5 percent Ti will take deformation without the appearance of cracks, but higher Ti content (20 percent) renders them brittle. The ductility of alloys diminishes with increasing Cr content (over 0.2 percent to 5 percent Cr), but beyond that it shows little change, while as Nb and Ta increase to 5 percent it increases, after which it undergoes a pronounced drop and is 5 percent at 20 percent Nb, and 24 percent at 10 percent Ta. Specimens containing 15-20 percent V fail under compression. Mo-W alloys will undergo 20 percent deformation without cracks (at 10 percent W and 1 percent B). Bibliography: 16 references.

Ye.K.

1. Alloys--Hardness 2. Alloys--Ductility 3. Alloys--Microstructure
4. Alloys--Properties

BARON, V. V.

Category : USSR/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Compounds E-9

Abs Jour : Ref Zhur - Fizika No 2, 1957 No 3950

Author : Savitskiy, Ye M., Baron, V.V.

Inst : Institute of Metallurgy Academy of Sciences USSR; Inst. Organic & Inorganic Chem., AN USSR

Title : Concerning the Additiveness of Mechanical Properties of Metallic Alloys and Mixtures

Orig Pub : Izv. Sektora fiz.-khim. analiza IONKh AN SSSR, 1956, 27, 86-96

Abstract : Using the systems Mg-Si, Mg-Ge, Cu-Si, Al-Cu, Ni-Si, and Co-Si as examples, it is shown that the mechanical properties of two-phase metallic alloy-mixtures depend substantially on the mutual distribution of the structure of components in these mixtures. The presence of a soft component (for example, a eutectic component), distributed over the boundaries of the solid phase, causes a sharp reduction in the hardness of the alloy. No additive dependence of the properties on the composition is observed in this case. If the soft component is located in the alloy in the form of individual inclusions and if the structure is in general broken up the character of the dependence of the properties on the

Card : 1/2

Category : USSR/Solid State Physics - Mechanical Properties of Crystals and Polycrystalline Compounds E-9

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3950

composition is closer to additive. Such a distribution of the components can be obtained if there is a small difference in their melting points (Cu-Al), particularly by hot deformation of cast alloys; if the difference in the melting temperatures is considerable (Al-Si, Mg-Si, Cu-Si), the metal ceramic method is more effective. The mechanical properties of the C Al alloys at higher temperatures approach additiveness to a greater extent owing to the strong softening of the $Cu-Al_2$ compound. In solid solutions based on the Mg-Zn, $Mg-Zn_2$ and $Mg-Zn_5$ compounds, the hardness also varies linearly with the composition at ordinary and high temperatures

Card 2/2

BAREN, V.V.

137-1957-12-23520

Translation from: Referativnyy zhurnal, Metallurgiya, 1957, Nr 12, p 98 (USSR)

AUTHORS: Savitskiy, Ye. M. Baren, V. V.

TITLE: Preparation of Alloys by the Method of Substitution of a Low-melting Component (Prigotovleniye splavov metodom zameshcheniya legkoplavkoy sostavlyayushchey)

PERIODICAL: Tr. In-ta metallurgii AN SSSR 1957, Nr 1, pp 148-157

ABSTRACT: Experiments were conducted on the substitution of a low melting component in the alloys of Al with Cu, Ni, and Si. The replacement of the eutectic with a harder component increases the hardness of the alloy; it also increases the strength of the plastic alloys but lowers it in the case of the brittle alloys. Thus the hardness of an alloy containing 25 percent Si was increased from 52 kg/mm^2 to 240 kh/mm^2 by replacing the eutectic component (microhardness 80-85 kg/mm^2) with an identical alloy of Al with Cu (microhardness 350 kg/mm^2). If the eutectic is replaced by a softer component the hardness of the alloy is decreased.

Card 1/1

G. S.

1. Alloys--Component substitution--Methods

BARON, V.V.

AUTHOR SAVITSKIY Ye.M., BARON V.V., IVANOVA K.N. 20-5-35/67

TITLE Diagram of Molybdenum Recrystallization.
(Diagramma rekristallizatsii molibdena - Russian)

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 5, pp 1070-1072 (U.S.S.R.)
Received 7/1957 Reviewed 8/1957

ABSTRACT Apart from other factors, the size of grain is known to influence the mechanical properties of metals. In the case of molybdenum this manifests itself with particular clearness. A brittle and coarse-grained structure can be rendered more fine and uniform by a suitably selected heat treatment. In this way the material becomes more plastic and is better suited for cold treatment. Therefore the setting up of a recrystallization diagram for molybdenum, which contains the size of grain, degree of degree of deformation, and annealing temperature, is of particular interest. As hitherto this problem had been but little investigated, the authors carried out the recrystallization of molybdenum of the first type. In order to obtain a uniform, fine initial structure, the material was several times forged at from 1600 to 1200°. The total degree of deformation amounted to 96%. As a result of this treatment the very coarse and uneven structure disappeared. Forging at low temperatures led to the formation of texture. After annealing in the vacuum at 1300° the samples had a polyhedric fine-grained structure with an average size of grain of about 22. - 25 . On the strength of these results it may be assumed that the hot for-

Card 1/2

Diagram of Molybdenum Recrystallization. 20-5-35/67

ged molybdenum can be annealied up to 1400° after cold treatment at degrees of deformation of more than 20%. On this occasion the grain remains fine. Higher annealing temperatures lead to the formation of a coarse-grained structure after annealing.
(23 illustrations, 1 table).

ASSOCIATION Institute for Metallurgy "A.A.BAYKOV" of the Academy of Science
PRESENTED BY BARDIN I.P., Member of the Academy
SUBMITTED 30.10.1956
AVAILABLE Library of Congress
Card 2/2

SAVITSKIY, Ye.M.; BARON, V.V.

Mechanical properties of silicon at various temperatures. Trudy Inst.met. no.3:191-194 '58. (MIRA 12:3)
(Silicon--Testing)

78-3 3-30/47

AUTHORS: Savitskiy, Ye. M., Baron, V. V., Tylkina, M. A.

TITLE: The Phase Diagrams and Properties of Gallium and Thallium Alloys (Diagrammy sostoyaniya i svoystva splavov galliya i talliya)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 3, pp. 763-775 (USSR)

ABSTRACT: The structural and physico-mechanical properties of the alloys of gallium with silicon and germanium in all concentrations as well as of gallium with antimony, manganese, copper and thallium with lanthanum were investigated. The phase diagram of gallium with silicon is of an eutectic type. All alloys consist of two phases. The addition of silicon to gallium highly increases the hardness and the electric resistance of silicon. The phase diagram of gallium and germanium also is of an eutectic type. The eutectic composition melts at 29°C and has a gallium content of 99,45 %. All alloys of this system possess metallic conductivity.

Card 1/3 The structure and the properties of the alloys of gallium and

The Phase Diagrams and Properties of Gallium and Thallium Alloys

antimony were examined for hardness microhardness, plasticity, strength and electric resistance between 20 and 600°C. Alloys with 63,59 - 64,08 % antimony at room temperature have a maximum electric resistance which decreases with a rise of temperature. This proves that these alloys possess properties of semiconductors. The structure and the properties of the alloys of gallium with 50 - 86,3 % gallium were examined by microstructure, hardness, strength, microhardness and electric resistance at temperatures of 20-300°C. The following compounds occur in the alloys: MgGa and Mg_5Ga_2. Alloys in the domain of the compound MgGa show the highest hardness and the smallest strength and plasticity. The system gallium-copper with 15 - 85 % gallium was also investigated for microstructure, hardness, strength, microhardness and electric resistance. The results showed that by the addition of gallium to copper hardness, strength and electric resistance increase, but that the plasticity decreases. The electric resistance of the alloys increases with a rise of temperature. The phase diagrams and the properties of the alloys of gallium with germanium, gallium with silicon and gallium with lanthanum were also investigated. Alloys between silicon and thallium do not occur. In the system lanthanum-

The Phase Diagrams and Properties of Gallium and Thallium Alloys

78-3 3-38/47

-thallium the compound La_2Tl occurs which possesses an high electric resistance and an high hardness. There are 15 figures and 19 references, 0 of which are Soviet.

ASSOCIATION: Institut metallurgii im. A. A. Baykova, Akademii nauk SSSR (Metallurgical Institute imeni A. A. Baykov, AS USSR)

SUBMITTED: June 25, 1957

Card 3/3

SOV/24-58-4-6/39

AUTHORS: Baron, V.V., Yefimov, Yu.V. and Savitskiy, Ye.M. (Moscow)

TITLE: The Structure and Properties of Alloys in the Vanadium-Molybdenum System (Struktura i svoystva splavov sistemy vanadiy-molibden)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 4, pp 36 - 40 (USSR)

ABSTRACT: A vanadium-molybdenum phase diagram has not been published so far. As Mo and V have the same crystal lattices, similar atomic diameters and identical electron structures, it is possible to assume that these two elements form a continuous series of solid solutions. This assumption has been confirmed experimentally when measuring the lattice parameters of powder-metallurgical specimens of V-Mo. However, cast V-Mo alloys are reported to exhibit a second phase at between 10 and 60% Mo.
No data on the physical and mechanical properties of these alloys exist. The authors have carried out an investigation of the structure and properties of V-Mo alloys, established their melting temperatures and constructed a phase diagram for them.
Alumothermal vanadium, containing 95.5% V, 0.9% Al, 0.15% Fe,

Card1/4

The Structure and Properties of Alloys in the Vanadium-Molybdenum System

0.2% C, 0.3% Si and a considerable quantity of oxygen, and molybdenum in the form of sintered rods, containing 99.00% Mo, 0.075% C, 0.04% Fe and traces of Si and W, served as raw materials. The alloys were prepared in an arc furnace, provided with an insoluble tungsten electrode, in a helium atmosphere. The voltage applied was 60 V and the current 1 000 A, the electrode diameter being 8 mm. Each alloy was remelted four times in order to ensure even mixing, and each ingot weighed 60 to 70 g. Spectroscopic analysis of the alloys for impurities showed the presence of 0.01% each of Fe, Mn and Si and traces of Mg and W. The solidus and liquidus temperatures for alloys of various compositions were determined and a phase diagram constructed (Figure 1). This shows that all alloys are solid solutions. The as-cast structures were examined and hardness values determined. The specimens were then homogenised by annealing for 10 hours at 1 600 °C in vacuo. The microstructures of the homogenised specimens were also examined and hardness, microhardness, plasticity under a compressive load and electrical resistance determined. Hardness was

The Structure and Properties of Alloys in the Vanadium-Molybdenum System

measured under a 50 kg load for 30 sec, microhardness under a 50 g load.
The microstructures of the cast alloys are shown in Figure 2. The alloys with up to 30% V are single-phased. The alloys with 30-60% V show dendritic liquation and those with 80-90% V have a finely dispersed precipitate with a coarse-grained background. After the homogenising treatment (Figure 3) alloys with up to 60% V are single phased. Alloys richer in vanadium have coagulated particles (mainly Al_2O_3) in the grain boundaries and within the grains. Homogenisation also results in grain growth. Addition of vanadium to molybdenum results in an increase in hardness. The alloys have a greater hardness before the homogenising treatment (Figure 4, Curves 1 and 2). The maximum hardness is 380 kg/mm^2 for the as-cast alloys and 315 kg/mm^2 for the homogenised alloys. Microhardness (Figure 4, Curve 3) is higher and the maximum is

 675 kg/mm^2 at 60-70% V. The difference between the hardness

The Structure and Properties of Alloys in the Vanadium-Molybdenum System

and microhardness values is due to the preparation of the microsections and the presence of the intergranular constituent. The hardness-composition curve is the normal type for metals forming unlimited solid solutions. The plasticity decreases with increase of the second component (Figure 4, Curve 4), especially in the region 40 - 60% V where the tensile strength is 100 - 150 kg/mm^2. The greatest plasticity is shown by pure molybdenum. The electrical resistance-composition curve at room temperature is shown in Figure 5. The curve is similar to the hardness curve with a maximum of 50 μΩ/cm at 60% V. The results obtained confirm that V and Mo form a continuous series of solid solutions.

There are 5 figures and 7 references, 2 of which are Soviet, 1 German and 4 English.

SUBMITTED: November 28, 1957

Card 4/4

SAVITSKIY, Ye.M.; BARON, V.V.; IVANOVA, K.N.

Investigation of the recrystallization of niobium and its alloys. Inzh.-fiz.zhur. no.11:38-45 N '58. (MIRA 12:1)

1. Institut metallurgii imeni A.A. Baykova AN SSSR, g. Moskva.
(Niobium--Metallography)

67808

18.1200 SOV/180-59-5-25/37

AUTHORS: Agafonova, M.I., Baron, V.V., and Savitskiy, Ye.M. (Moscow)

TITLE: Structure and Properties of Niobium-Tin Alloys

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1959, Nr 5, pp 138-141 (USSR) (+ 1 plate)

ABSTRACT: Metallo-ceramic niobium of the following composition (wt %) was used as the starting material: Nb 98.1, Ta 1.2, Ti 0.15, Fe 0.085, N 0.2, C 0.03, O 0.2, Si 0.04 and Pb 5.10^{-3}, and 0-1 tin (99.9% Sn). The alloys were prepared in an arc furnace on a water-cooled copper hearth, using insoluble tungsten electrodes, in an atmosphere of chemically pure argon (0.6 atm pressure). As the boiling point of tin is lower than the melting point of niobium (2280° as against 2415 °C), considerable evaporation of tin occurred on melting. Therefore, 50% more tin was added to the charge than the calculated amount. The arc melting method enables niobium alloys with any tin content to be prepared. The authors have prepared ingots of 22 alloys, weighing up to 40 g. The composition of the alloys is shown in Table 1. In order to ensure a uniform composition the alloys were remelted

Card 1/6

Structure and Properties of Niobium-Tin Alloys

several times. Alloys containing up to 30% tin were annealed in evacuated quartz double ampoules in a Silit furnace at 1100 °C for 50 hours. Alloys richer in tin, in view of their lower melting point, were annealed at 200 °C for 100 hours. One part of the alloys (containing 85-100% Sn) were deformed by approximately 60% by cold forging, prior to annealing. The limit of solubility of tin in niobium was determined by quenching and testing the microhardness. Water quenching of the alloys was carried out in evacuated quartz double ampoules from the following temperatures: 800 °C, (after soaking for 100 hours) and 1100 °C (after soaking for 50 hours). Quenching from 1400 and 2000 °C (after soaking for 20 minutes) was carried out in an apparatus for measuring melting temperatures, quenching from 1800 °C was carried out in the vacuum furnace TVV (after soaking for 3 hours). Sections for microscopic analysis were prepared by the usual method. Alloys containing up to 35% Sn were etched in a mixture of HNO_3 and HF (concd) and those containing between 35 and 100% Sn, in a 30% aqueous solution of HCl. The microhardness of the

Structure and Properties of Niobium-Tin Alloys

alloys was tested with a PMT-2 instrument, using a load of 20 g. The hardness of the alloys was tested in a Vickers hardness testing machine at a load of 5 kg. X-ray investigations of annealed alloys were carried out in a Debye camera with a Cu-irradiation. The melting temperature of the more refractory niobium-tin alloys was determined by the drop method, using an optical pyrometer. The temperature was measured at which the first drop appeared in the drilled-out centre bore of a specimen; the ratio between the depth and the diameter of the bore was approximately 4; this ensured practically absolutely black body conditions. The thermal analysis of less refractory alloys (between 30 and 100% Sn) was carried out with a Kurnakov pyrometer which uses differential registration, in sealed quartz ampoules. In this case the highest measured temperature did not exceed 1000 °C. The determination of the rate of oxidation of the alloys was carried out on specimens of rectangular shape by measuring the gain in weight. The surface of the specimen was first ground on a fine emery paper. Then the specimens were placed in annealed

Structure and Properties of Niobium-Tin Alloys

beryllium oxide crucibles and held there for one hour in air. On the basis of the results obtained, which are shown in Table 2, the thermal equilibrium diagram of the Nb-Sn system was constructed (Fig 1). Experimental results obtained in the investigation of the microstructure and measurements of the microhardness of the alloys are shown in Figs 2 and 3 respectively. It has been found radiographically that the parameter changes in the solid solution range are negligible, as the atomic radii of the two elements are very similar. Alloys containing more than 9.5% tin exhibit a second phase along the grain boundaries at room temperature (Fig 2g), consisting of the compound Nb_3Sn, which forms at 2000 °C in the peritectic reaction. This compound has a complex cubic structure of the β-W type with a lattice parameter of a = 5.29 Å, is very brittle and has a great microhardness ($H\mu$ = 900 kg/mm^2). A further increase in tin content leads to the appearance of a soft ($H\mu$ = 10 kg/mm^2), low melting-point tin-rich phase which melts at 232 °C, and subsequently to a separation of the alloy into the molten and solid states (Fig 2e, zh, and z) (see Table 2).

Card 4/6

Structure and Properties of Niobium-Tin Alloys

No intermediate phases have been observed in the system by microscopic and X-ray analyses. The solubility of niobium in tin at the melting point of tin is less than 0.1%. The hardness of alloys in the region of niobium-base solid solutions increases from 150 kg/mm^2 (for niobium) to 300 kg/mm^2 (at a maximum tin content). In the 2-phased region the hardness continues to increase additively until the Nb_3Sn_4 compound is formed, the hardness of which is 900 kg/mm^2 (Fig 4). The hardness of tin-rich alloys is close to that of tin (9 kg/mm^2) and hardly increases with increase in tin content of up to 20% due to the presence of a soft tin-rich phase. In Fig 5 the results of the measurement of the rate of oxidation of Nb-Sn alloys in the concentration range of 0-20% Sn on holding in air at 800 and 1000 °C for one hour, are shown. The results shown in Figs 4 and 5 show that the alloys in the solid solution range of tin in niobium have a greater hardness and resistance to oxidation than pure niobium.

Card 5/6

There are 5 figures, 2 tables and 6 references, of which 4 1 is Soviet, 1 is German and 4 are English.

67808

SOV/180-59-5-25/37

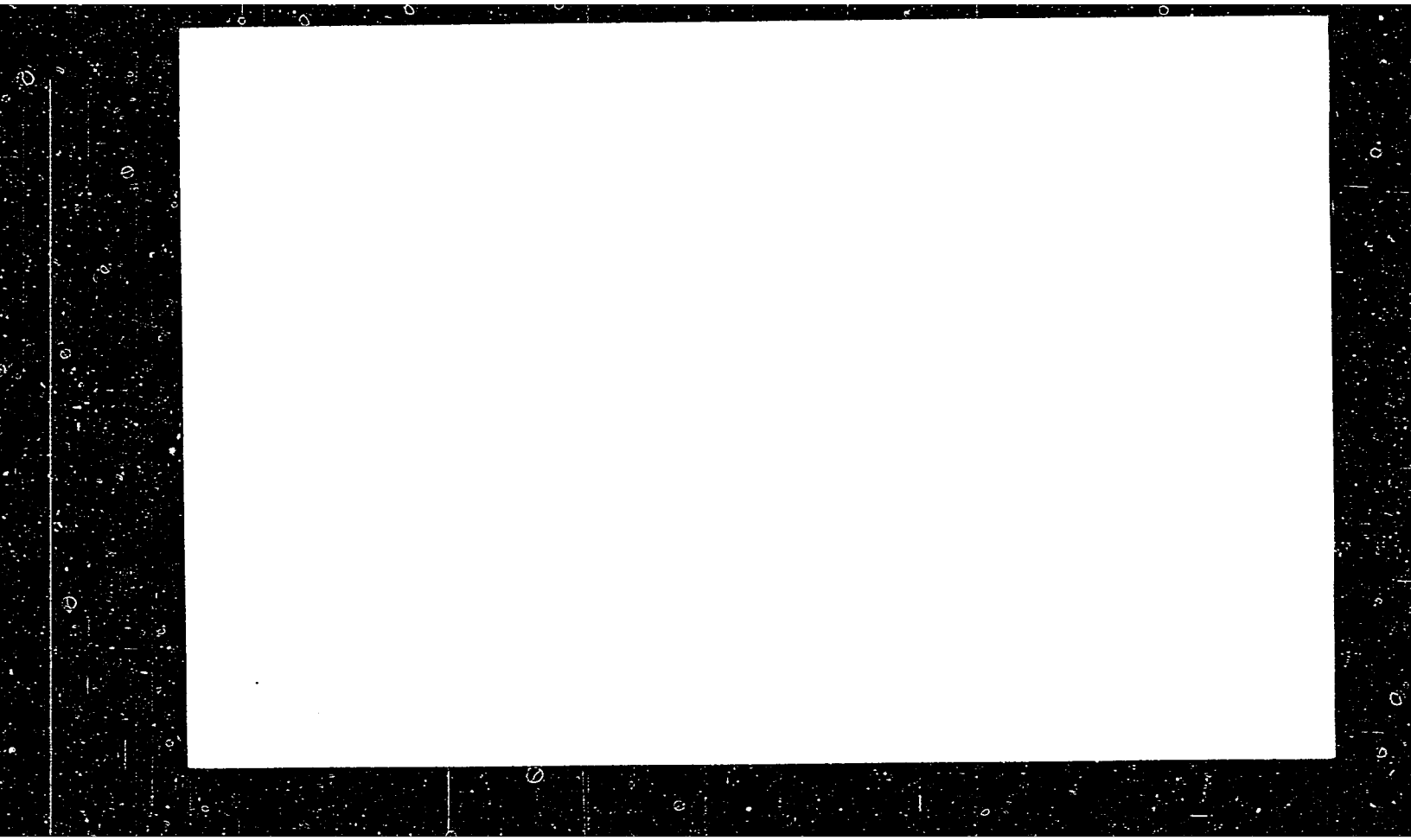
Structure and Properties of Niobium-Tin Alloys

ASSOCIATION: Institut metallurgii, AN SSSR
(Institute of Metallurgy, Ac.Sc. USSR)

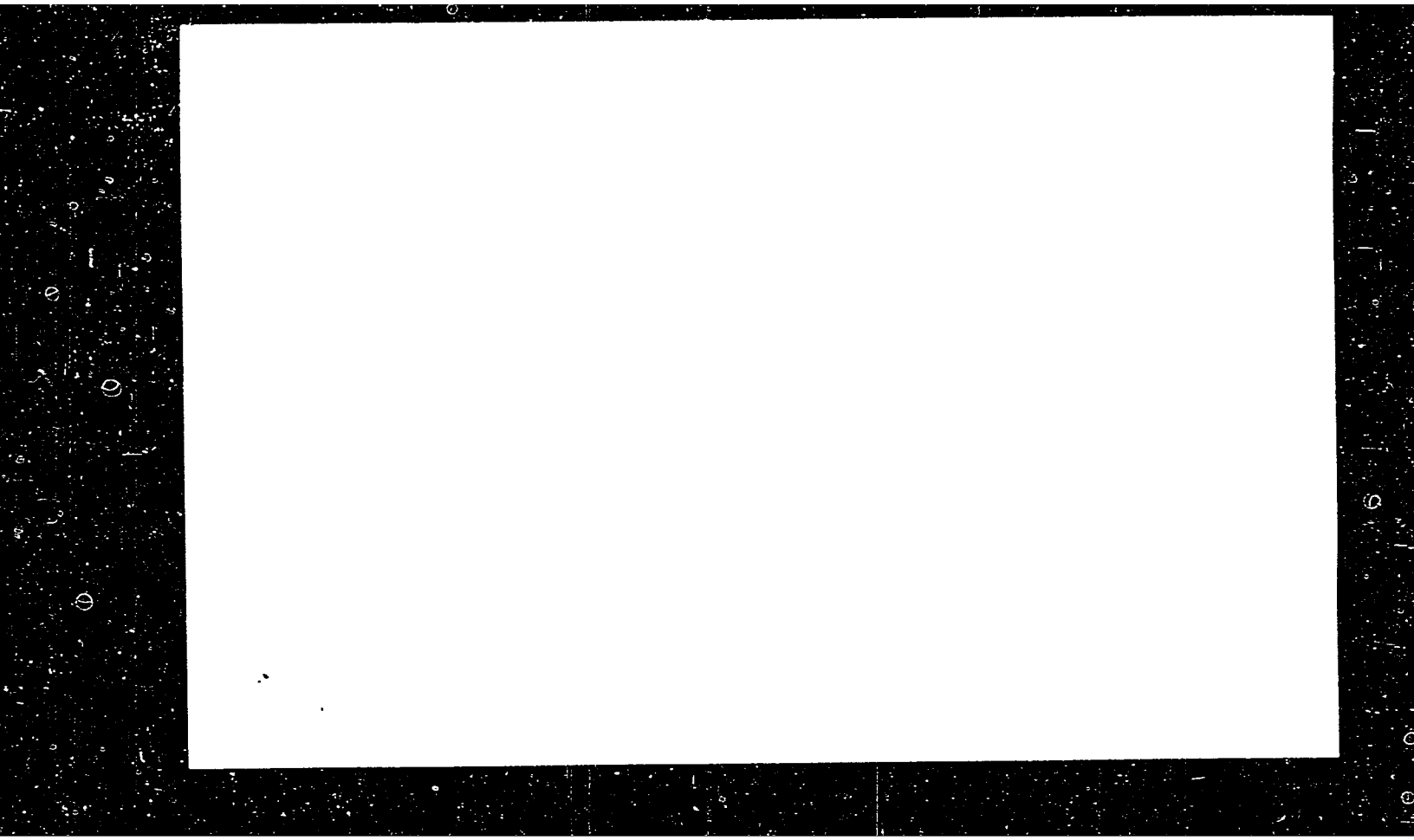
SUBMITTED: July 2, 1959

4

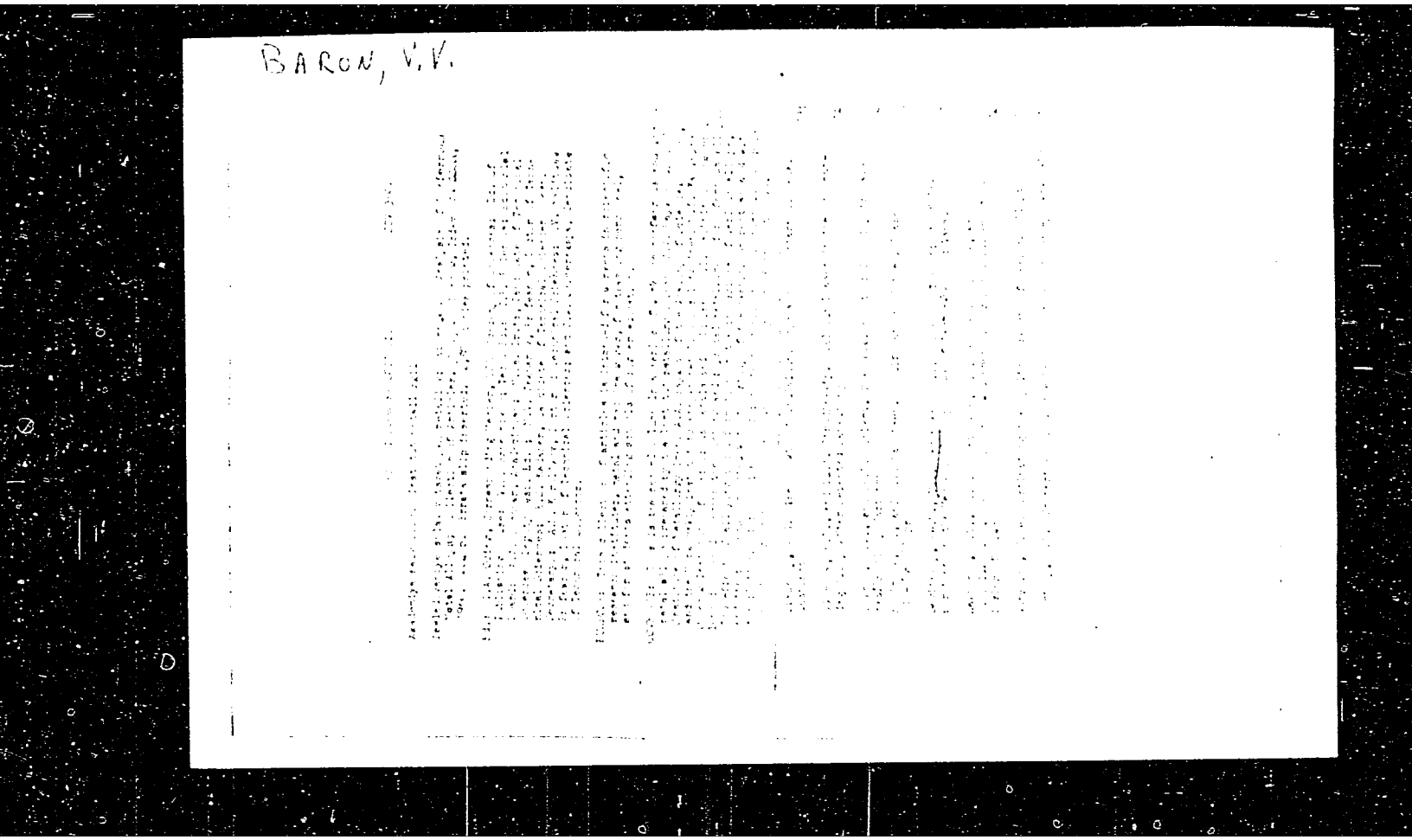
Card 6/6



APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000203710008-0"



APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000203710008-0"



BARON, V.V.

PHASE I BOOK EXPLOITATION SOV/5459
SOV/16-3-5

Akademiya nauk SSSR. Institut metallurgii

Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody issledovaniya (Physicochemical Research Methods in Metallurgy and Metal Science) Moscow, Izd-vo AN SSSR, 1960. 251 p. (Series: Its: Trudy, vyp. 5) Errata slip inserted. 2,200 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut metallurgii imeni A.A. Baykova.

Resp. Ed.: I.P. Bardin, Academician (Deceased); Ed. of Publishing House: V.A. Klimov; Tech. Ed.: T.P. Polenova.

PURPOSE: This collection of articles is intended for metallurgists and metal researchers.

COVERAGE: The collection contains articles on metallurgy, metal science, and physicochemical research methods. Separate articles discuss the structure and properties of some metals and alloys. The effect of cold treatment and inclusions on the properties of alloys are analyzed, and instruments and

Card 6/7

(2)

Baron, V. V.

PHASE I BOOK EXPLOITATION SOV/4164

Vsesoyuznoye soveshchaniye po splavam redkikh metallov. 1st, Moscow, 1957

Redkiye metally i splavy; trudy... (Rare Metals and Alloys; Transactions of the First All-Union Conference on Rare-Metal Alloys) Moscow, Metallurgizdat, 1960. 438 p. 3,150 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut metallurgii; USSR Komissiya po redkim metallam pri nauchno-tekhnicheskom komitete.

Ed.: I.I. Shapovalov; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: P.G. Islent'yeva.

PURPOSE: This collection of articles is intended for metallurgical engineers, physicists, and workers in the machine-building and radio-engineering industries. It may also be used by students of schools of higher education.

COVERAGE: The collection contains technical papers which were presented and discussed at the First All-Union Conference on Rare-Metal Alloys, held in the Institute of Metallurgy, Academy of Sciences USSR in November 1957. Results of investigations of rare-metal alloys, titanium, and copper-base alloys with additions of rare metals are presented and discussed along with investigations of rhenium, vanadium, niobium, and their alloys. The effect of rare-earth metals on properties of magnesium alloys and steels is analysed. The uses of rhenium as a dehydrating catalyst, electroplating material, and material suitable for making plugs for automobile electrical systems are discussed. Also, the effect of the addition of certain elements on the properties of heat-resistant steel is examined and alloys with special physical properties (particularly semiconductive alloys) are discussed. No personalities are mentioned. Soviet and non-Soviet references accompany some of the articles.

PART II. TITANIUM, AND COPPER-BASE ALLOYS WITH RARE-METAL ADDITIONS

Rare Metals (Cont.) SOV/4164

PART III. RHENIUM, VANADIUM, NIOBIUM, ZIRCONIUM AND ALLOYS BASED ON THEM

Card 4/8

12.1200

66687
S/180/60/000/01/009/027
E071/E135

AUTHORS: Baron, V.V., Yefimov, Yu.V., and Savitskiy, Ye.M. (Moscow)

TITLE: The Structure and Properties of Alloys of the Vanadium-Tungsten System

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, Nr 1, pp 70-74 (USSR)

ABSTRACT: The microstructure, hardness, plasticity, strength and susceptibility to oxidation of vanadium-tungsten alloys in the whole range of concentrations was investigated. The following starting materials were used: vanadium, 98.6% V, 0.3% C, 0.5% oxygen, 0.2% nitrogen, 0.06% sulphur and less than 0.2% of metallic admixtures; tungsten, 99.95% Wo, 0.032% Mo, remaining oxygen and nitrogen. About 40 g samples of alloys were melted in an arc furnace with non-consumable tungsten electrodes in a medium of helium under pressure of 0.5 atm. In all cases the content of tungsten was 1% higher than in the starting charge. Cast alloys were annealed at 1100 °C for 500 hours in double quartz sheaths, evacuated and sealed. Specimens for the investigation were prepared

Card 1/3

The Structure and Properties of Alloys of the Vanadium-Tungsten System

by anode cutting with subsequent polishing. The solidus temperatures were determined by the drop method, metallographic and X-ray analyses by the usual methods, hardness by the Vickers apparatus, plasticity and strength on compression of specimens 4 x 4 x 6 mm in a "Gagarin" press, and the susceptibility to oxidation on heating in air by the gravimetric method (increase in weight, or decrease in weight after mechanical or chemical removal of the scale formed). In some cases the scale was chemically analysed. On the basis of the results obtained the equilibrium diagram of the system vanadium-tungsten was constructed (Fig 1). Vanadium and tungsten form a continuous series of solid solutions. The solidus and liquidus curves possess a sharply expressed minimum at 4.5 at.% of tungsten equal to 1635 °C. However, no transformations in the solid state in alloys, corresponding to this section of the diagram, were observed. Small additions of tungsten to vanadium (of the above quoted purity) cause an increase in

68687

S/180/60/000/01/009/027
E071/E135

The Structure and Properties of Alloys of the Vanadium-Tungsten System

plasticity, a decrease in hardness and a small increase in the compression strength. Further increase in the content of tungsten causes changes in properties, characteristic for systems with continuous solubility in the solid state. Vanadium decreases the resistance of tungsten to oxidation. At temperatures between 700 and 1100 °C all alloys as well as starting metals are strongly oxidised and require protection (Fig 3). The microstructure of annealed vanadium-tungsten alloys is shown in Fig 2.

Card 3/3

There are 3 figures and 2 references, of which 1 is English and 1 is German. There is also a table (p 70).

SUBMITTED: July 2, 1959

4

82628
S/180/60/000/004/023/027
E111/E452

18.1200

AUTHORS: Baron, V.V., Ivanova, K.N. and Savitskiy, Ye.M. (Moscow)

TITLE: Phase Diagram and Some Properties of Alloys of the System Niobium-Molybdenum-Vanadium

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, No.4, pp.143-149 + 1 plate

TEXT: The microstructures in the as-cast and annealed states (Fig.1), hardness (Fig.2,5), melting points (table) were determined for the ternary Nb-Mo-V (and corresponding binary) systems. The solidus isotherms are projected on the triangular diagram and the corresponding binary fusion diagrams are plotted in Fig.3. A continuous solid-solution range for the ternary system was found. The solidus-isotherms show that the fusion temperature of the alloys falls (from 2450 to 1800°C) as the vanadium rises. At the niobium corner of the diagram, alloys had the lowest hardness (105 to 220 kg/mm^2). The oxidation of the alloys at 1000 to 1200°C was also studied: specimens were placed in crucibles pre-ignited to constant weight, the gain in

Card 1/2

82628

S/180/60/000/004/023/027
E111/E452

Phase Diagram and Some Properties of Alloys of the System Niobium-Molybdenum-Vanadium

weight for 1 hour's heating in air being determined. The results (shown by curves "v" in Fig.2 and 4) indicated that the best resistance to scaling is possessed in the binary systems by 5% Mo, 5% V (at 1000°C) and 15.4% Mo, 2.4% V (at 1200°C); and in the ternary by alloys with 5% Mo, 2.8% V and 5% Mo, 5.6% V, which also have other advantageous properties. A common feature of all alloys with high molybdenum and vanadium contents is a high oxidation rate. Variation of hardness with composition in binary and ternary alloys corresponded to property changes characteristic for a continuous series of solid solutions. Variation of scaling resistance with composition does not show such a relation. In general, increase in scaling resistance of the ternary niobium alloys occurred at a lower degree of alloying than with binary alloys. Some ternary alloys oxidized faster at 1000 than at 1200°C. There are 5 figures, 1 table and 8 references: 3 Soviet and 5 English.

SUBMITTED: April 1, 1960

Card 2/2

18.1235

S/509/60/000/004/020/024
E111/E152

AUTHORS: Savitskiy, Ye.M., Baron, V.V., and Yefimov, Yu.V.

TITLE: Phase Diagram and Properties of Vanadium--Chromium Alloys

PERIODICAL: Akademiya nauk SSSR. Institut metallurgii. Trudy, No.4, 1960. Metallurgiya metallovedeniye, fiziko-khimicheskiye metody issledovaniya, pp.230-235

TEXT: The authors describe their work on the vanadium--chromium phase diagram. Their starting materials were: alumino-thermic vanadium (95.5% V, 1.0 Al, 0.15 Fe, 0.2 C, 0.3 Si, considerable concentration of oxygen) and electrolytically refined chromium (99.9% Cr, 0.02 Fe, 0.03 Si, 0.02 N, 0.002 H, 0.0023 O). Alloys were arc melted (non-consumable tungsten electrode) under helium, each ingot of 50 g being remelted four times and analysed. Compositions of the charges and alloys are shown in the first two main columns of a table. Solidus and liquidus temperatures were determined under argon in an apparatus constructed in the Laboratoriya splavov redkikh elementov IMET AN SSSR (Laboratory of Alloys of Rare Elements, IMET AS USSR). Specimens were heated by

Card 1/4

Phase Diagram and Properties of Vanadium--Chromium Alloys

currert from a type OCY-40 (OSU-40) transformer. temperature was determined with an optical pyrometer calibrated under similar conditions against melting points of pure nickel, titanium, zirconium, niobium and molybdenum. Liquidus temperature was the reading when the specimen lost cohesion. the solidus, that when a hole drilled in the 4 x 4 x 15 mm specimen fused over. Curves 1 and 2 in Fig.1 show plots of these temperatures against wt.% Cr (the relatively low value for vanadium is due to impurities). Microstructure was studied and hardness measured on the cast alloys and alloys annealed for 100 hours at 1100 °C in evacuated quartz capsules and slowly cooled. The hardness (H_K, kg/mm^2) results are shown in Fig.1; curves III and IV correspond to the cast and annealed states respectively; and curve V gives hardness at 1000 °C (annealed alloys). Hardness was determined with a 50-kg load on a "pobedite" cone in argon at the high-temperature which was measured with a Pt/Pt-Rh thermocouple. Electrical resistivity of annealed 4 x 4 x 15-20 mm specimens was determined potentiometrically at room temperature. results are

Card 2/4

Phase Diagram and Properties of Vanadium—Chromium Alloys

shown in curve VI of Fig.1. The work showed that a continuous range of solid solutions is formed. Increase in concentration of the second component produces a rise in both hardness and resistivity.
There are 2 figures, 1 table and 3 English references.

S/509/60/000/004/020/024
E111/E152

Phase Diagram and Properties of Vanadium—Chromium Alloys

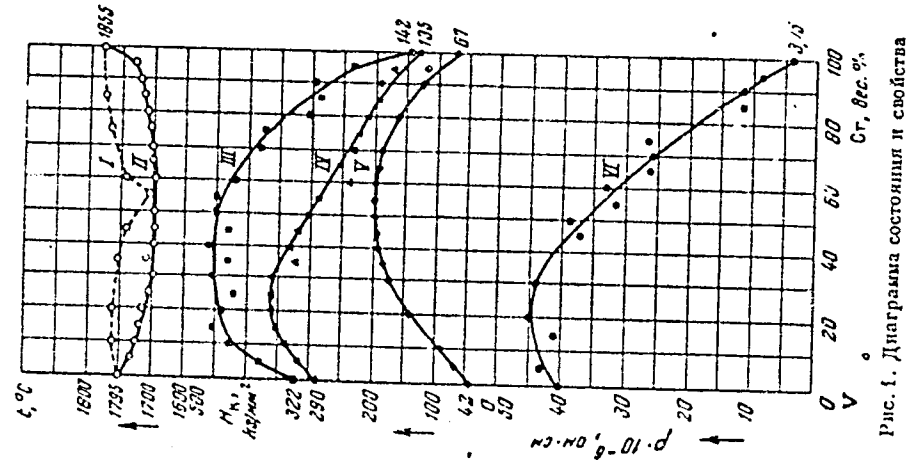


Рис. 1. Диаграмма состояния и свойства

Fig. 1

Card 4/4

88474

181210

S/078/61/006/001/009/019
B017/B054

AUTHORS: Baron, V. V., Savitskiy, Ye. M.

TITLE: Structure and Properties of Niobium - Aluminum Alloys

PERIODICAL: Zhurnal neorganicheskoy khimii, 1961, Vol. 6, No. 1, pp. 182 - 185

TEXT: The state diagram of niobium - aluminum alloys was studied by microscopic, thermal, and X-ray analyses, as well as by determinations of the micromelting point. Fig.1 shows the state diagram. Niobium of a purity of 99.0% (0.5% by weight of Ta, 0.02% by weight of Fe, 0.026% by weight of Ti, and 0.02% by weight of Si) and aluminum of a purity of 99.99% were used as initial materials. Table 2 gives the melting points of the alloys. The hardness of the alloys was measured with a ПМТ-3 (PMT-3) instrument under a load of 20 g, and the electric resistance with a ППТН-1 (PPTN-1) potentiometer at room temperature. Stability to corrosion was tested by treatment with water vapor at 400°C and 300 atm overpressure during 1000 hours. The following three compounds were found by studies of the fine structure and determinations of melting points: Nb_3Al, Nb_2Al, and

Card 1/4

88474

Structure and Properties of Niobium - Aluminum Alloys

S/078/61/006/001/009/019
B017/B054

$NbAl_3$. Solubility of aluminum in niobium is about 6% by weight of aluminum at 2120°C, and 4.5% at room temperature. A solubility of niobium in aluminum was not observed. By addition of niobium, aluminum grains become smaller; solid solutions are formed on the basis of compounds Nb_3Al and Nb_2Al. The compounds Nb_2Al and $NbAl_3$ form a eutectic at 630 ± 10°C. $NbAl_3$ and Al form a low-melting eutectic (656°C). Hardness and electric resistance of niobium rise with increasing aluminum content. Alloys of niobium and aluminum show increased stability to water vapor at elevated temperatures and pressures (400°C, 300 atm overpressure). Compound Nb_3Al is a superconductor with a transition temperature of 17°K. N. Ye. Alekseyev determined the superconductivity. There are 2 figures, 2 tables, and 7 references: 1 Soviet, 1 US, 1 British, 1 French, and 3 German.

SUBMITTED: October 2, 1959

Card 2/4

S/078/61/006/001/009/019
B017/B054

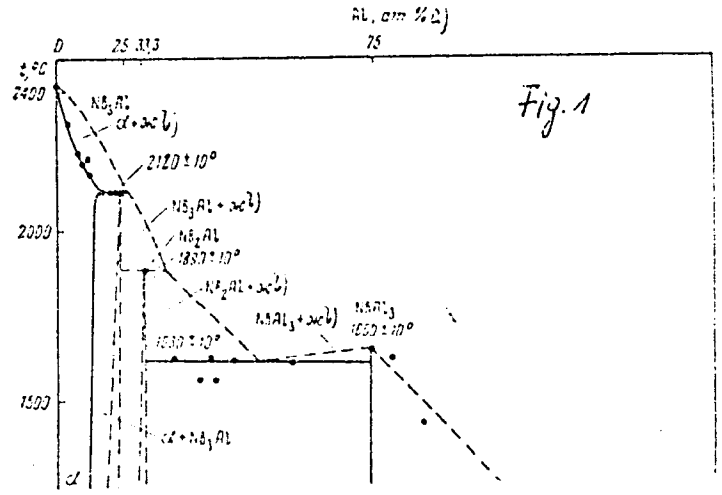
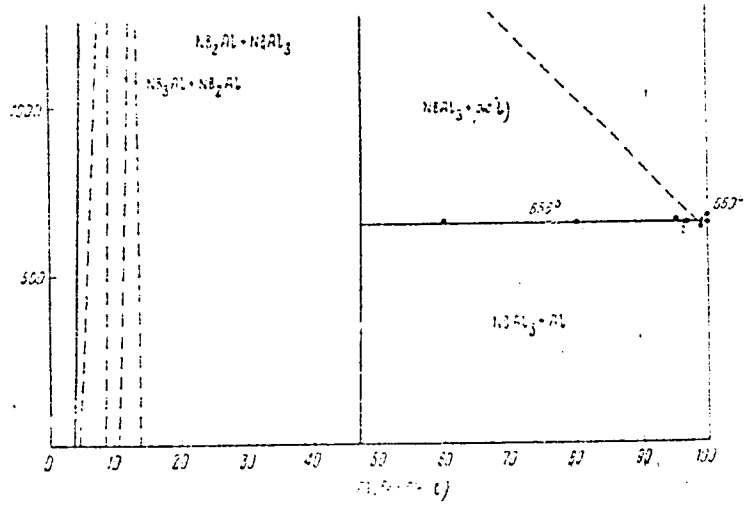


Fig. 1

Card 3/4



Legend to Fig.1: a) = atom%; b) = liquid; c) = % by weight

Card 4/4

S/137/62/000/003/107/191
A060/A101

18 1200

AUTHORS: Savitskiy, Ye. M., Baron, V. V., Yefimov, Yu. V.

TITLE: Study of the alloys vanadium-copper-carbon and vanadium-copper-aluminum

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962, 8-9, abstract 3I56 ("Tr. In-ta metallurgii. AN SSSR", 1961, no. 8, 120-127)

TEXT: Aluminothermic V (96.5%), carbothermic V (98%), and electrolytic Cu mark M0 (M0) were taken as the starting materials. The alloys with Al were charged with an addition of Cu to the alumothermic V, and addition of C in the carbothermic V. The alloys were smelted in an arc furnace in a He atmosphere, homogenized at 1,000°C for 100 hours, and investigated by the methods of thermal, microscopic and X-ray structure analyses and by the measurement of the mechanical characteristics. The vertical sections were constructed of the V vertex of the system V - Cu - Al and V - Cu - C at a constant composition of 1.5% Al and C. The solubility of Cu in the aluminothermic V at 20°C is about 7.5%, and as the temperature increases so does the solubility, reaching a maximum (9.4% Cu) at 1,530°C. In the system V-Cu-Al one observes a wide region of lamination in

Card 1/2

Study of the alloys vanadium-copper-carbon ...

the liquid and the solid states, beginning at about 16% V. The monotectic temperature is equal to 1,530°C. The melting temperature of V in Cu is 1,120°C. The limiting solubility of Cu in alloys V-C at room temperature is about 1%, and at 1,575°C - about 3.5%. The addition of C raises the temperature of monotectic equilibrium from 1,530 to 1,575°C and extends the region of immiscibility. The lamination in V-Cu-C alloys is observed beginning from 11% Cu. Cu raises the hardness and lowers the ductility of V. In V-Cu-C alloys a second V-phase was found with a hexagonal lattice; one supposes that it is the γ-phase. There are 8 references.

Z. Rogachevskaya

[Abstracter's note: Complete translation]

Card 2/2

S/137/62/000/003/109/191
A060/A101

18.1200

AUTHORS: Baron, V. V., Agafonova, M. I., Savitskiy, Ye. M.

TITLE: Structure and characteristics of alloys of the niobium vertex of the niobium-vanadium-aluminum system

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962, 9-10, abstract 3I62 ("Tr. In-ta metallurgii, AN SSSR", 1961, no. 8, 269-277)

TEXT: A study was made of the Nb vertex of the Nb-V-Al system at a content of up to 10% V and Al. The alloys were smelted from alumothermic V (96.5%), metalloceramic Nb (99.1%) and Al (99.99%) in an arc furnace in a He environment, were annealed at 1,100°C for 50 hours and hardened in the TVV-2 (TVV-2) furnace at 1,600°C. The investigation was carried out by the methods of thermal microscopic, and X-ray structure analyses, hardness measurements, microhardness measurement, fire-resistance determination. The smelting temperature of the alloys was determined by the drop test method. The isothermal section of the Nb vertex of the Nb-V-Al system at 20°C and the vertical section at a ratio of V : Al = 1.4 were constructed. At a content of 4% V in Nb at room temperature up

Card 1/2

Structure and characteristics ...

to 6% Al can be dissolved. V and Al raise the fire-resistance of Nb which is maximum in alloys with 3 - 8% V and ~1% Al and 1.8 - 2.2% V and 3.2 - 4.8% Al. There are 7 references.

Z. Rogachevskaya

[Abstracter's note: Complete translation]

Card 2/2

BARON, V.V.; YEFIMOV, Yu.V.; SAVITSKIY, Ye.M.

Structure and properties of the vanadium alloy angle in the system vanadium - aluminum - zirconium. Trudy Inst. met. no.8: 278-285 '61. (MIRA 14:10)
(Vanadium-aluminum-zirconium alloys--Metallography)
(Phase rule and equilibrium)

29533
S/078/61/006/011/011/013
B101/B147

18 1280

AUTHORS: Savitskiy, Ye. M., Baron, V. V., Khotinskaya, A. N.

TITLE: Phase diagram of the system niobium-palladium

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 11, 1961, 2603-2605

TEXT: The present paper deals with the examination of hardly fusible alloys on the basis of hardly fusible rare metals and precious metals. The phase diagram of the system Nb-Pd was determined (Fig. 2a). The compound Nb_2Pd forms on the basis of the peritectic reaction liqu + $\beta \rightleftarrows Nb_2Pd$ (β = solid solution based on Nb) at 1650 ± 25°C. It has a tetragonal σ-phase crystal lattice. The lattice constants are: a = 0.98 Å, c = 0.11 Å; c/a = 0.52. [Abstracter's note: One of the data given for a, c, and a/c is wrong. From a and c it follows that c/a = 5.2.] The hardness of Nb_2Pd is 578 kg/mm^2, and its microhardness is 645 kg/mm^2. The compound is brittle. The Kurnakov compound Pd_3Nb forms from the melt

Card 1/3

Phase diagram of the system...

at 1700°C. The crystal structure of this phase is being studied by Ye. I. Gladyshevskiy and P. I. Kripyakevich. Hardness is 225 kg/mm^2, microhardness 321 kg/mm^2. The existence of these compounds is expressed in the curves plotted for the various properties of the alloys: thermo emf (Fig. 2б), hardness (Fig. 2в), and oxidation rate (Fig. 2г). There are 2 figures and 3 references: 1 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: P. Greenfild, P. Beck, Trans. AIME, 206, 265 (1956); A. C. Knapton, J. of the Less Common Metals, 2, 113 (1960).

ASSOCIATION: Institut metallurgii Akademii nauk SSSR (Institute of Metallurgy of the Academy of Sciences USSR)

SUBMITTED: March 11, 1961

Fig. 2. System Nb-Pd. (а) Phase diagram; (б) absolute thermo-emf; (в) Vickers hardness of [illegible]ered samples; (г) oxidation rate at 1200°C. Legend: (1) atom% of Nb; (2) liquid; (3) thermo-emf, μv/°C; (4) Hv, kg/mm^2; (5) oxidation rate, mg/cm^2·hr; (6) Nb, % by weight

Card 2/2

S/180/62/000/001/013/014
E040/E135

18.1147

AUTHORS: Savitskiy, Ye.M., Baron, V.V., and T'Ao Tsu-Tsung (Moscow)

TITLE: Effect of rare earth metals on the ductility of cast molybdenum

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo. no.1, 1962, 156-159 + 1 plate

TEXT: The effect is examined of individual rare earth metals on the ductility of cast molybdenum. As starting materials were used technically-pure molybdenum (99.9% pure), Mischmetall, lanthanum, praseodymium, neodymium, gadolinium and ittrium, the addition range being of 0.2-5% by weight. Test alloys (60 g) were prepared in an arc-furnace with a non-consumable electrode, in the atmosphere of helium under a pressure of 250 mm Hg. In order to ensure homogeneous composition, each test alloy was re-melted three times. The specimens were vacuum-annealed at 1450 °C for one hour, after

Card 1/4

which they were subjected to chemical analysis, examined microscopically, tested for hardness and investigated with regard to the transition temperature into the brittle state. According to chemical analysis, 80 to 90% of the rare-earth metals added to the initial charge are lost through evaporation. Microscopic examination revealed that the grain size of cast Mo is not affected by the addition of rare-earth metals. Test results are reported in detail and show that small additions of Mischmetall, lanthanum and cerium ($< 0.15\%$) lower the Vickers hardness of cast molybdenum from 175 to 150 kg/mm^2. At comparatively high additions ($> 0.15\%$) of the rare earth metals, traces were observed of a second phase but no reduction in the hardness of molybdenum. The transition temperature into the brittle state in cast molybdenum was found to drop sharply at low additions of Mischmetall, lanthanum and cerium, but this trend was reversed when the quantity of the addition was increased (more than 0.15%). The highest improvement in the ductility of molybdenum was achieved by the addition of lanthanum. The transition temperature of Mo - 0.1% La alloy is close to room

temperature, i.e. it is about 500 °C lower than that of commercially-pure molybdenum. The transition temperature of Mo alloy with 0.01-0.03% Nd or Pr is below room temperature. However, with 0.07% Pr, the transition temperature rises to 420 °C; this is explained by the appearance of the second phase. The transition temperature of Mo-0.01% Gd alloy is 130 °C, rising to over 600 °C with an increase of Gd content to 0.15%. Similarly, small additions of Y lower the hardness and transition temperature of cast Mo, although to a lesser degree than other rare-earth metals. The transition temperature of Mo-0.15% Y alloy is above 600 °C. The effect of small additions of praseodymium on the hardness and transition temperature of cast molybdenum is analogous to those of Mischmetall, lanthanum and cerium additions. The praseodymium and neodymium concentrations in the alloys possessing the lowest transition temperature into the brittle state are lower than the corresponding contents of the other rare-earth metals here examined. The authors conclude that small additions of Mischmetall, lanthanum, cerium, praseodymium and neodymium lower the hardness and especially the

Effect of rare earth metals on ...

ductile-to-brittle transition temperature of technically-pure cast molybdenum. This effect is ascribed to a refining action of rare earth metals on the penetration type (interstitial) impurities in molybdenum in consequence of a high chemical reactivity of rare earths. The appearance in the alloys of a second phase leads to a reverse effect, i.e. the transition temperature is increased. The addition of 0.08% La, 0.01% Nd and 0.03% Pr to cast molybdenum was found to have the greatest beneficial effect on its ductility and reduces its transition temperature by about 500 °C. Attempts to cold-roll specimens of this molybdenum failed, however. The solubility of rare-earth metals in molybdenum was found not to exceed 0.1%. There are 5 figures and 1 table.

SUBMITTED: July 2, 1961

Card 4/4

X

S/180/62/000/002/012/018
E040/E535

12.1152

AUTHORS: Savitskiy, Ye.M., Baron, V.V. and Ivanova, K.N.(Moscow)

TITLE: Melting diagram and some properties of niobium-molybdenum-tungsten alloys

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no.2, 1962, 119-125

TEXT: In spite of the fact that the structure and properties of the ternary Nb-W-Mo alloys are of a considerable practical interest because of the good refractory characteristics of the constituent elements, practically no studies have been made in this field, with the exception of investigations of the phase equilibrium composition diagrams of the binary alloy systems involving the same three elements. The purpose of the present investigation was therefore to construct the phase equilibrium diagram of the Nb-Mo-W system and to examine the properties of some of its alloys. As the starting materials Nb (99.5% pure), Mo (99.99% pure) and tungsten (99.9% pure) were used. The test alloys were prepared by the arc-melting technique in a furnace

Card 1/4

with a non-consumable tungsten electrode in an atmosphere of purified helium under a pressure of 400 mm Hg. To ensure equilibrium conditions, the test alloys were re-melted four to five times. The composition of the test alloys was controlled by weighing, and chemical analysis was resorted to only if the difference in the weight of the specimens differed by more than 0.4-0.6% from the weight calculated for the required compositions. The cast specimens were homogenization annealed at 1000°C for 500 hours in evacuated quartz ampoules. The etchants used were the same as for pure metals except that the concentration was adjusted to suit the test alloy examined. Niobium was etched with a mixture of hydrofluoric and nitric acids, molybdenum with a mixture of sulphuric and nitric acids and tungsten by means of a mixture consisting of potassium ferrocyanide, caustic soda and water. Lattice parameters of crystals of the ternary solid solutions were determined by means of X-ray analysis on specimens annealed at 1000°C for 2000 hours and quenched from the same temperature. Measurement of hardness at room and elevated temperatures (1000°C), as well as microstructural analysis, were

carried out on specimens of alloys from the Nb-Mo-W corner with constant molybdenum concentrations of 5, 10, 20, 30, 40, 60 and 75 weight %. In the cast state, the alloys had the characteristic dendritic structure of solid solutions; in the annealed state they were single-phase. No new phases were observed after annealing. On the basis of microstructural analysis of the 'as cast' and annealed specimens, determination of the melting points and X-ray examination data, the melting diagram was constructed of the Nb-Mo-W system. The existence was established of an unlimited solubility of the components of the system in the liquid and solid states. Isotherms of the solidus alloys showed that the melting temperature drops from 3200°C to 2400°C with decreasing tungsten concentration in the alloys. In the concentration range investigated, the alloys containing about 70-90% Nb (remainder Mo and W) were found to have the lowest drop in strength at 1000°C. The highest resistance to oxidation was found in binary niobium-base alloys with 10-15% Mo and 15-30% W (by weight). The highest resistance to oxidation among the ternary alloys was shown by niobium-base alloys containing

not more than 20 wt.% W and 10 wt.% Mo. Consequently, the most promising and most refractory alloys for service in the temperature range up to 3200°C are the alloys in the niobium corner of the Nb-Mo-W ternary system. There are 6 figures.

SUBMITTED: May 27, 1961

Card 4/4

S/180/62/000/003/015/016
E193/E192

AUTHORS: Savitskiy, Ye.M., Baron, V.V., and Yefimov, Yu.V. (Moscow)

TITLE: The effect of cerium on plasticity of vanadium

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no.3, 1962, 107-113

TEXT: The object of the present investigation was to explore the possibilities of achieving the removal of N, O and S from vanadium and thereby improving its placticity, by addition of cerium to vanadium melts. Both alumino- and carbo-thermic vanadium was used in the preparation of experimental samples (10-15 g in weight), which were melted in a tungsten arc furnace with water-cooled copper hearth in an atmosphere of pure helium at 0.9 atm. The proportion of cerium added varied from 0.2 to 50% wt. Each sample was remelted four times to ensure homogeneity of the metal. The buttons obtained in this manner were mechanically descaled and the vanadium-rich layer, separated

Card 1/4

from the cerium layer, was used to conduct chemical and gas analyses, metallographic examination, hardness measurements, compression tests and cold rolling tests. The conclusions were as follows. 1) Cerium has limited solubility in both solid and liquid vanadium. The liquid miscibility gap begins at 0.2-0.3 % wt. Ce, and the solid solubility of Ce in V is less than 0.1 % wt. 2) Addition of Ce to V melts brings about a considerable decrease in its oxygen, nitrogen and sulphur content and causes a corresponding improvement in its plastic properties. This is demonstrated in Table 3, where some data for Ce-treated carbo-thermic vanadium are given. It should be pointed out that complete purification of the melt cannot be achieved in one operation since a state of equilibrium is reached between liquid vanadium, cerium, and the slag; further decrease in the oxygen content in vanadium can be attained only by repeated removal of slag and addition of cerium until the required degree of purity of the melt is attained. Sample melt in Table 3 underwent five such operations. 3) The carbon and metallic impurities content in vanadium is not affected by Ce additions. 4) When large Ce

The effect of cerium on plasticity.. S/180/62/000/003/015/016
E193/E192

additions are required to purify heavily contaminated vanadium, difficulties may arise in melting the charge, owing to the formation of a thick layer of (mainly CeO_2) slag which either weakens, or even breaks, the arc, particularly when large (500-600 g) batches of vanadium are treated.
There are 3 figures and 6 tables.

SUBMITTED: September 18, 1961

Card 3/4

BARON, V.V.; YEFIMOV, Yu.V.; SAVITSKIY, Ye.M.

Effect of carbon, oxygen and nitrogen on the recrystallization of carbothermic vanadium. Issl. splav. tsvet. met. no.3:103-115 '62. (MIRA 15:8)

(Vanadium--Metallography)

S/078/62/007/003/018/019
B110/B138

18.1200

AUTHORS: Savitskiy, Ye. M., Baron, V. V., Yefimov, Yu. V.

TITLE: Constitution diagram of the vanadium - cerium system

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 3, 1962, 701 - 703

TEXT: The constitution diagram of the vanadium - cerium system with up to 50% by weight cerium was investigated by macrostructural, microstructural, thermal, and X-ray diffraction analyses, and by microhardness tests. Carbothermic V (99.766%) and metallic cerium (98.8%) were fused in an electric arc furnace in He atmosphere at 0.9 atm. Alloys with up to 1% by weight of cerium were annealed for 100 hrs at 1100°C, and those with higher Ce content for 200 - 250 hrs at 750°C. A second cerium-rich layer appeared at 0.2 - 0.3% of Ce. The vanadium-rich layers were single-phase. Ce was only slightly soluble in V (maximum 0.1%) and independent of temperature. Measured on a ПМТ-3 (PMT-3) apparatus at 100 g microhardness increased from 150 to 165-170 kg/mm^2 when 0.05 - 0.1% Ce was added. Using the drop method of measuring melting point (Izv. AN SSSR, Otd. tekhn. n., no. 4, 36 (1958)) the monotectic equilibrium point was found to be

Card 1/3

close to the melting point of V (1885 ± 15°C). V raises the melting point of Ce by only 5 - 7°C, apparently forming a peritectic, and lowers the temperature of the polymorphous $\gamma \rightarrow \delta$ Ce transformation by 20-25°C. The fusion of commercial V, containing O_2 and N_2 impurities, with Ce reduces hardness and increases ductility in the cold state by reducing the O_2 and N_2. Ce-refined V can be cold-rolled up to 95% deformation. There are 2 figures and 4 references: 3 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: S. A. Komjathy, R. H. Read, W. Rostoker. Phase relationships in selected binary and ternary Vanadium - base alloys systems. Armour Research Foundation of Illinois Institute of Technology. Wadc Technical Report 59 - 483, p. 6 - 15, January 1960.

SUBMITTED: September 16, 1961

APPROVED FOR RELEASE: 06/06/2000 CIA-RDP86-00513R000203710008-0"

37171

S/078/62/007/005/011/014
B101/B110

18 9200

AUTHORS: Savitskiy, Ye. M., Baron, V. V., Yefimov, Yu. V., Gladyshevskiy, Ye. I.

TITLE: Investigation of the system vanadium - molybdenum - silicon

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 5, 1962, 1117-1125

TEXT: The ternary phase diagram of the system V - Mo - Si was plotted by means of x-ray analysis, microstructural analysis, and microhardness measurement (Fig.9). Results: (1) No new ternary compounds are formed with a structure deviating from that of binary V and Mo silicides. (2) Between the isostructural compounds V_3Si and Mo_3Si, as well as V_5Si_3 and Mo_5Si_3, continuous series of solid solutions are formed in which the Si content varies by 1 to 2%. The range of the homogeneous ternary solid solution $(V,Mo)_5Si_3$ extends above 1500°C toward higher Si contents. (3) The ternary eutectic $(V,Mo)_5Si_3$ - $(Mo,V)Si_2$ - $(V,Mo)Si_2$

Card 1/3